

Pattern Electroretinogram Parameters in Untreated Glaucoma Suspects With Signs of Conversion

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PURPOSE

To prospectively monitor progressive changes of retinal ganglion cell (RGC) function in glaucoma suspects (GS) with clinical signs of conversion, contrasted to a group of non-converters, using Pattern Electroretinogram (PERG)

METHODS

Sixteen GS subjects (30 untreated eyes) with Humphrey 24-2 visual field test with Glaucoma Hemifield Test “Within Normal Limits”, with MD normal values better than -2.00(dB) and with suspicious optic nerve head were included in the study. Participants were observed over an average of 11.5 ± 3.7 months, during which they were tested with Diopsys NOVA PERG (Diopsys©, Inc. Pine Brook, NJ) and standard automated perimetry two times a year. Based on clinical data, two groups were formed and 9 eyes qualified as clinical converters, while 21 eyes remained as non-converters. Two-way repeated measures ANOVA were conducted as appropriate. This study was IRB approved and informed consent was signed by each subject

RESULTS

Over the short course of the study, 9 eyes showed signs of conversion according to visual field and Optical coherence tomography definitions. A two-way repeated measures (mixed between-within subjects) ANOVA was used to determine the effect of time (within-subject effects) and group (between subjects effects) over the PERG repeated measures variables (MagD and MagD/mag ratio). Normality of data was assessed by the Shapiro-wilk test and no outliers greater than ± 3 standard deviations were included. There was homogeneity of variance ($p > 0.05$) and covariances ($p > 0.05$), as assessed by Levene’s test of homogeneity of variance and Box’s M test, respectively. Mauchly’s test of sphericity indicated that the assumption of sphericity was met for the two-way interaction, $X^2(2) = 8.172$, $p = 0.379$. There was no statistically significant interaction between Time and PERG parameters, confirming that MagD and MadD/Mag ratio scores did not change significantly over our 3 time points. The main effect of group showed a significant difference in PERG parameters between the converter and non-converter groups $F(1,12) = 8.465$, $p = 0.013$, partial $\eta^2 = 0.414$ for MagD/Mag Ratio and $F(1,12) = 4.853$, $p = 0.048$, partial $\eta^2 = 0.288$ for MagD

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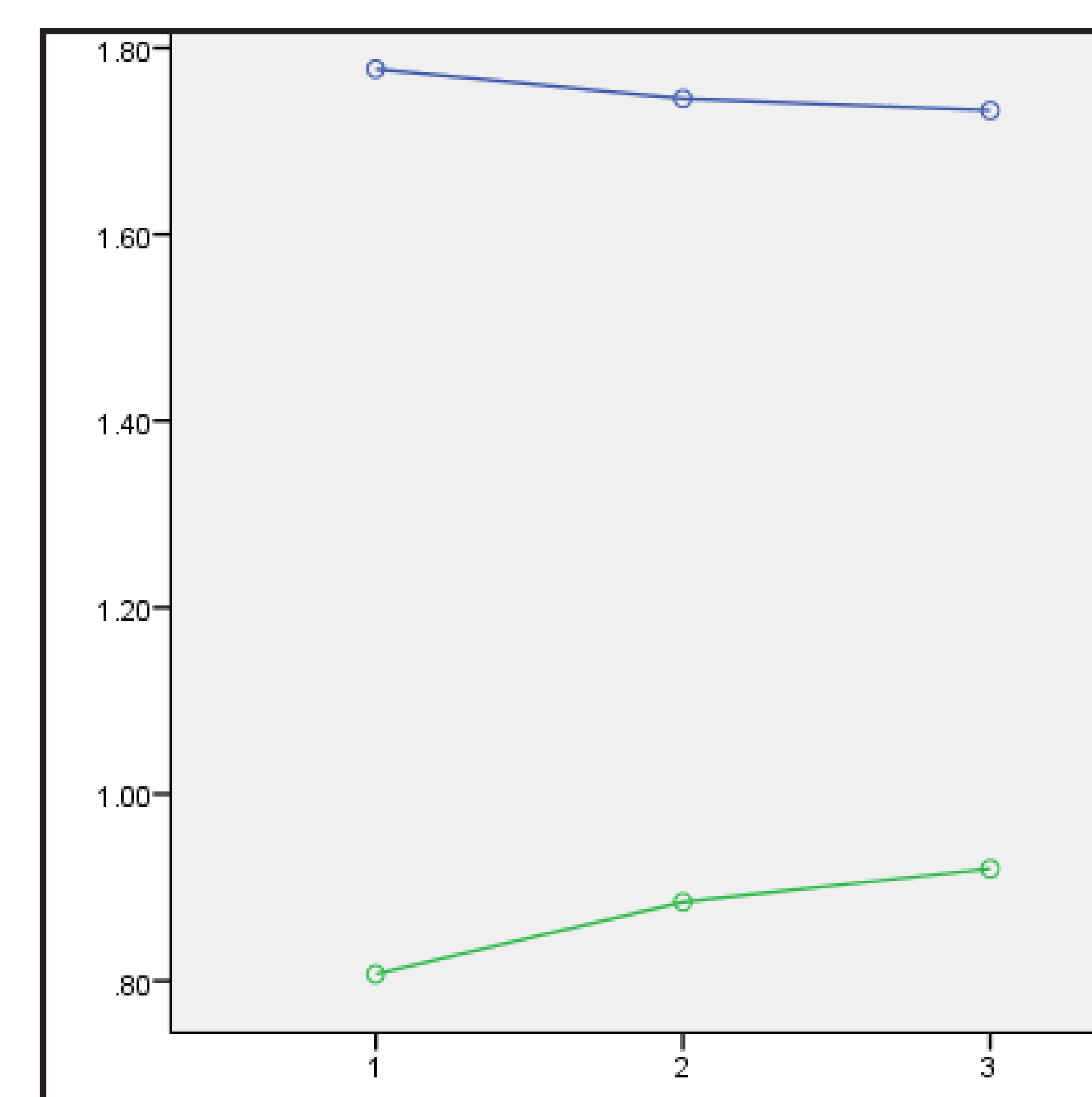
CONCLUSION

Slowly converting GS patients over time demonstrate RGC dysfunction associated with increased latency. These findings are clinically significant, especially when deciding when to start treatment

Fig.1: MagD and MagD/Mag Ratio (Mean ± St. Error) across 3 visits

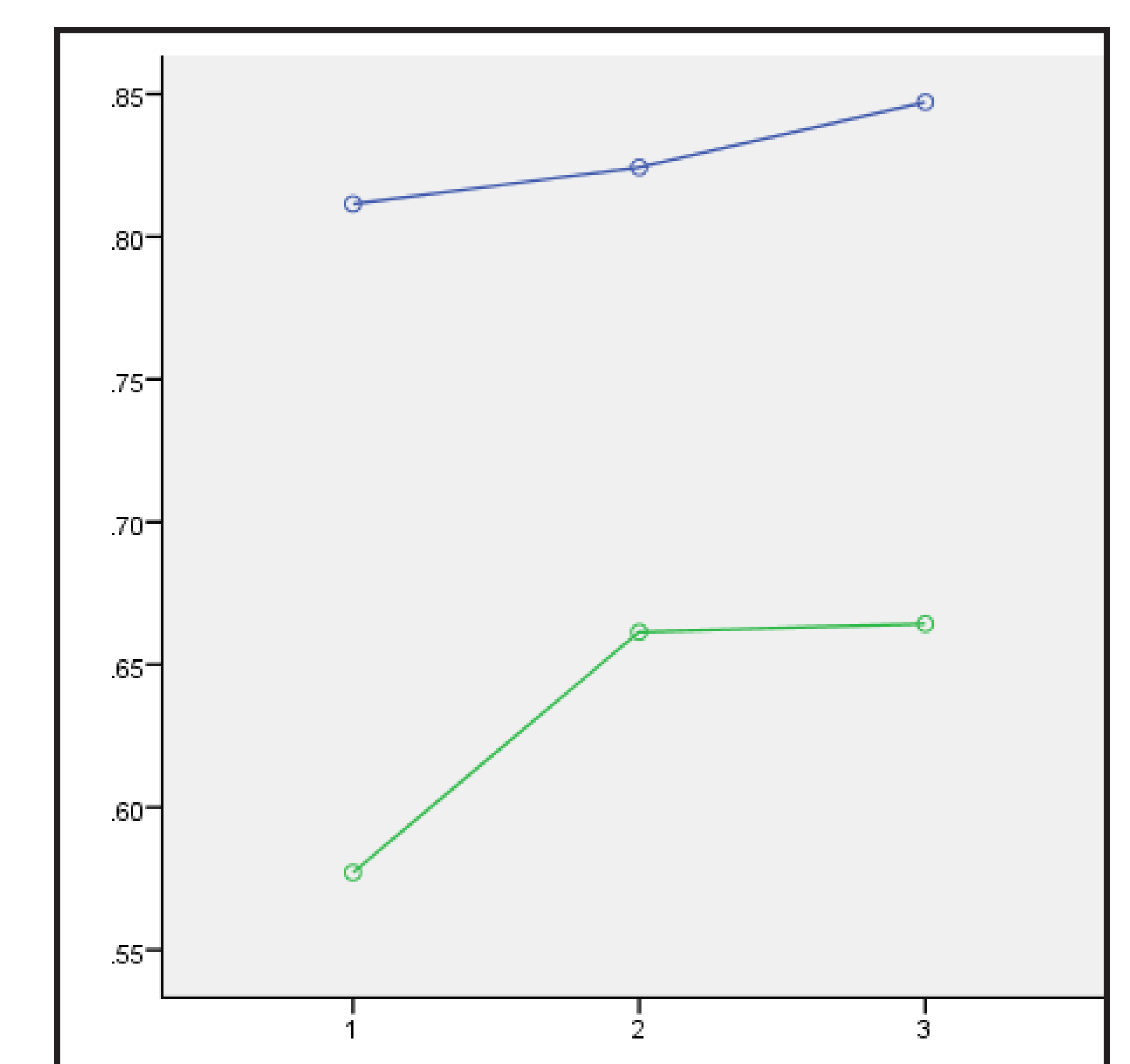
	Visit 1 (mean ± St Error)	Visit 2 (mean ± St Error)	Visit 3 (mean ± St Error)
MagD (Controls)	1.78 ± 0.3	1.75 ± 0.29	1.73 ± 0.3
MagD (progressors)	0.81 ± 0.3	0.88 ± 0.29	0.92 ± 0.3
MagD/Mag R. (controls)	0.8 ± 0.07	0.82 ± 0.05	0.85 ± 0.06
MagD/Mag R. (progres.)	0.58 ± 0.07	0.66 ± 0.06	0.66 ± 0.06

Fig.1: MagD and the between subject effect (main effect of group)



In blue: control non-converter group;
in green: converter group

Fig.2: Fig.1: MagD/Mag Ratio and the between subject effect (main effect of group)



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